

CLAIMS

What is claimed is:

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1. A method for preserving frame order across an aggregated link comprised of a plurality of virtual links each supporting a particular transmission rate, the method comprising:
 - (a) receiving up to a plurality of indications denoting commencement of frame transmission on each of the virtual links; and
 - (b) assigning a plurality of pointer values to a corresponding plurality of records in a pointer value buffer associated with each of the virtual links based, at least in part, on the relative order in which data frames are transmitted on each of the virtual links.
 2. The method of claim 1, further comprising:
 - (c) receiving the data frames transmitted on each of the plurality of virtual links in a common receive buffer.
 3. The method of claim 2, further comprising:
 - (d) reading the received frames from the common receive buffer based, at least in part, on the pointer value assigned in each of the pointer value buffers.
 4. The method of claim 3, wherein frames are promoted from the receive buffer with priority given to pointer value order in higher transmission rate pointer value buffers.

1 5. The method of claim 1, wherein a plurality of pointer value buffers are used to store
2 pointer values denoting the commencement of transmission of frames on a corresponding
3 plurality of virtual links supporting a particular transmission speed.

1 6. The method of claim 1, wherein received frames are promoted in pointer value order with
2 priority given pointer values stored in the pointer value buffers associated with higher
3 transmission rate virtual links.

1 7. The method of claim 1, wherein the indication is an analog indication.

1 8. The method of claim 7, wherein the data network is an Ethernet network and the
indication is a receive data valid (RX_DV) signal.

1 9. The method of claim 1, wherein the order of pointer values in each of the pointer value
buffers do not correspond to the order of frame transmission.

1 10. An apparatus comprising:

2 a receive buffer having a plurality of records in which to store received frames of data;

3 a plurality of pointer value buffers each associated with one of a plurality of virtual links

4 of an aggregated link, each of the virtual links supporting a distinct transmission speed; and

5 a network interface, coupled to the receive buffer and the pointer value buffers, to assign

6 a plurality of pointer values in appropriate ones of the plurality of pointer value buffers in

7 response to the commencement of transmission of frames on the associated virtual link.

11. The apparatus of claim 10, wherein frames transmitted over each of the virtual links are stored in the common receive buffer until retired by the apparatus.

12. The apparatus of claim 10, wherein the indication is an analog indication.

13. The apparatus of claim 12, wherein the indication is an asserted receive data valid signal.

14. The apparatus of claim 10, wherein the network interface retires the received frames from the receive buffer to a system state in order of pointer value in each of the plurality of pointer value buffers.

15. The apparatus of claim 14, wherein the frames are retired in pointer value order for each of the plurality of pointer value buffers, with priority given to pointer value buffers associated with higher transmission rate virtual links.

16. In a data network, a method for preserving frame order of a plurality of frames transmitted across a plurality of virtual links of a multi-link trunk, wherein each of the virtual links is associated with a discrete transmission rate, the method comprising:

(a) receiving up to a plurality of indications denoting commencement of frame transmission on each of the virtual links of the multi-link trunk; and

(b) assigning a plurality of pointer values to a plurality of records corresponding to a number of indications received from each of the virtual links in appropriate ones of a plurality of pointer value buffers associated with the plurality of virtual links based, at least in part, on a relative order in which the indications are received.

1 17. The method of claim 16, further comprising promoting the received frames from a
2 common receive buffer in pointer value order of the pointer value buffers, with priority given to
3 the pointer value buffers associated with the higher transmission rate virtual links.

1 18. The method of claim 16, wherein the indications are an analog signal denoting receive
2 data valid.

1 19. A storage medium comprising a plurality of executable instructions which, when
2 executed by a processor, cause the processor to implement a plurality of functions including a
3 function to preserve frame order of frames transmitted over a plurality of virtual links each
4 associated with a discrete transmission rate, the function implementing pointer value buffers
5 associated with each of the virtual links and, upon receiving an indication from the virtual link,
6 stores pointer values in appropriate ones of the pointer value buffers denoting commencement of
7 frame transmission on the virtual link.

1 20. The storage medium of claim 19, wherein the executable instructions further include
2 instructions to promote data frames received in a common buffer from the plurality of virtual
3 links in pointer value order as stored in the pointer value buffers, with priority given to pointer
4 values stored in pointer value buffers associated with higher transmission rates.